

PREOPERATIVE ENDOVASCULAR EMBOLISATION OF THE SYMPTOMATIC HEMANGIOMA IN 7TH THORACIC VERTEBRAE: CASE REPORT

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PREOPERATIVNA ENDOVASKULARNA EMBOLIZACIJA SIMPTOMATSKOG HEMANGIOMA SEDMOG TORAKALNOG PRŠLJENA: PRIKAZ SLUČAJA

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ABSTRACT

Although, as asymptomatic, they appear in about 10-12% of the worldwide population, vertebrae hemangiomas are symptomatic in about 0.9-1.2% of all the cases.

We showed the case of the symptomatic hemangioma in the 7th thoracic vertebrae in 67 year old patient, that was successfully preoperative embolised. Magnetic resonance imaging (MRI) detected the tumor in the body of 7th vertebrae with mass effect on the anterior aspect of the spinal cord. Multidetector computed tomography (MDCT) imaging describes this tumor as hemangioma that is in the body of the Th7 vertebrae and in the both pedicles. We performed selective and supraselective spinal angiography which showed pathological vascularisation of the tumor, and then the tumor was embolised. The control angiography detected the reduction of the tumor blood vessels, as a sign of the successful embolisation. Ten days after embolisation, the patient went through corporectomy of the Th7 and the stabilization of the thoracic spine was performed. Intraoperative blood transfusion in our patient was 930 mL, while expected blood transfusion during the surgical intervention without preoperative embolisation is about 1600 mL.

Method of choice in conditions with neurological compressive symptoms caused by vertebral hemangioma is surgery for the decompression of the nerve structures. Embolisation of aggressive vertebral hemangioma is recommended and preoperatively performed for the intraoperative hemorrhage reduction and decreasing of intraoperative complications.

Keywords: hemangioma, spine, spinal cord compression; angiography, embolisation, therapeutic, hemorrhage

SAŽETAK

Iako se, kao asimptomatski, sreću u oko 10-12% opšte populacije, hemangiomi kičmenih pršljenova su simptomatski u oko 0,9-1,2% od svih slučajeva.

Prikazali smo slučaj simptomatskog hemangioma sedmog torakalnog (Th7) pršljena kod bolesnice stare 67 godina, koji je preoperativno uspešno embolisan. Pregled magnetnom rezonancom je pokazao tumorsku promenu u telu Th7 pršljena sa "mass" efektom na prednji aspekt kičmene moždine. Na pregledu skenerom promena je okarakterisana kao hemangiom koji zahvata telo Th7 pršljena i oba pedikla. Učinjena je selektivna i supraselektivna spinalna angiografija na kojoj je prikazana patološka vaskularna mreža tumora, a nakon toga izvršena je embolizacija. Na kontrolnoj angiografiji uočena je redukcija vaskularne mreže tumora, kao znak uspešne embolizacije. Nakon 10 dana od embolizacije pacijentkinji je učinjena korporektomija Th7 i izvršena stabilizacija grudne kičme. Intraoperativna nadohnada krvi kod našeg pacijenta iznosila je 930 ml, dok je očekivana količina krvi za nadohnadu bez preoperativne embolizacije oko 1600 ml.

U stanjima sa neurološkim kompresivnim simptomima, metoda izbora u terapiji vertebralnih hemangioma je hirurška intervencija u cilju dekompresije nervnih struktura. Embolizacija agresivnih vertebralnih hemangioma se preporučuje i izvodi preoperativno u cilju smanjenja intraoperativnog krvarenja i time mogućih intraoperativnih komplikacija.

Ključne reči: hemangiom; kičma, kompresija kičmene moždine, angiografija, embolizacija, terapijska, hemoragija

ABBREVIATIONS

Th7- 7th thoracic vertebrae

MRI- Magnetic resonance imaging

MDCT- Multidetector computed tomography



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INTRODUCTION

Aggressive vertebral hemangiomas are benign vascular tumours that don't give metastases, instead they go through posterior cortex of the involving vertebrae, spread in epidural space and cause compression on the spinal cord with destabilisation of the spine (1). In cases like this surgery is necessary for the decompression of spinal cord and stabilisation of the spine (2). Most vertebral hemangiomas are asymptomatic and are detected in about 10-12% of the worldwide population (3-6). Symptomatic vertebral hemangiomas occur in about 0.9-1.2% of all the cases (7, 8).

Percutaneous embolisation with alcohol in the combination with percutaneous vertebroplastic didn't give satisfying results in motoric deficit elimination (9). Because of the rich vascularisation of hemangioma, hemorrhage is common surgical complication, that sometimes may endanger the life of the patient (1, 10). Spinal hemangioma embolisation with endovascular approach under the control of fluoroscopy can reduce intraoperative hemorrhage (11). Embolic agents such as embolisation fluid, sclerosation fluid, embolisation particles and mechanical occlusion devices are used for the embolisation (11-14).

The purpose of our case report is to present the case of the patient with hemangioma in the Th7 vertebrae that has undergone the surgery after embolisation and corpectomy with spinal stabilization.

CASE REPORT

The sixty-seven year old patient was hospitalised due to the progressive weakness of the lower extremities with the urgent urination, positive Babinski reflex on the right side and an increased sensitivity level at Th7 on both sides. The MRI imaging of thoracic spine with the intravenous application of paramagnetic contrast showed changed signal intensity of Th7 vertebrae, with symmetrical epidural extension, foraminal and paravertebral to the right, which with its MRI characteristics (the increased signal intensity in T2W/STIR sequence, decreased in T1W with significant postcontrast increase of signal intensity) can relate to a wider differential diagnosis including aggressive hemangioma. Circular changes with similar MRI characteristics described in vertebral bodies of C7, Th2, Th6 and Th9, can be atypical hemangiomas (Figures 1 and 2).

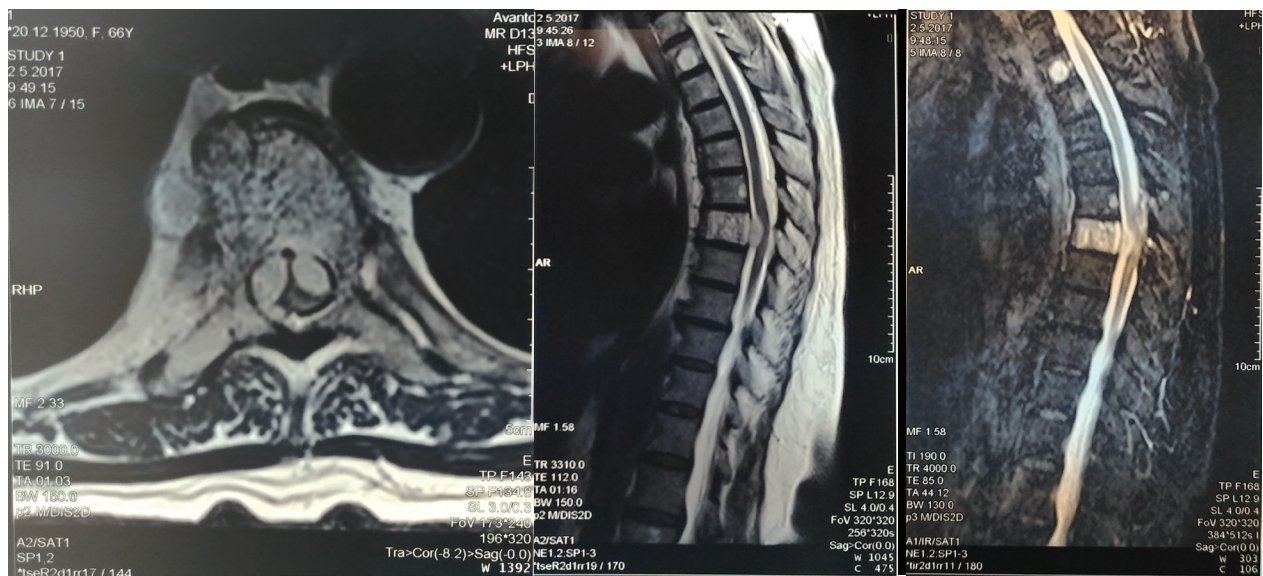


Figure 1. Left and middle: MRI axial and sagittal cross-section in the T2W sequence show an inhomogeneously elevated signal intensity with the capture of the posterior elements to the right and the epidural spreading on both sides and compression of the anterior aspect of the spinal cord. Right: The lesion shows a significant increase in the intensity of the signal postcontrast. Oval changes in similar MRI characteristics in Th2 and Th6 vertebral bodies are also visible.

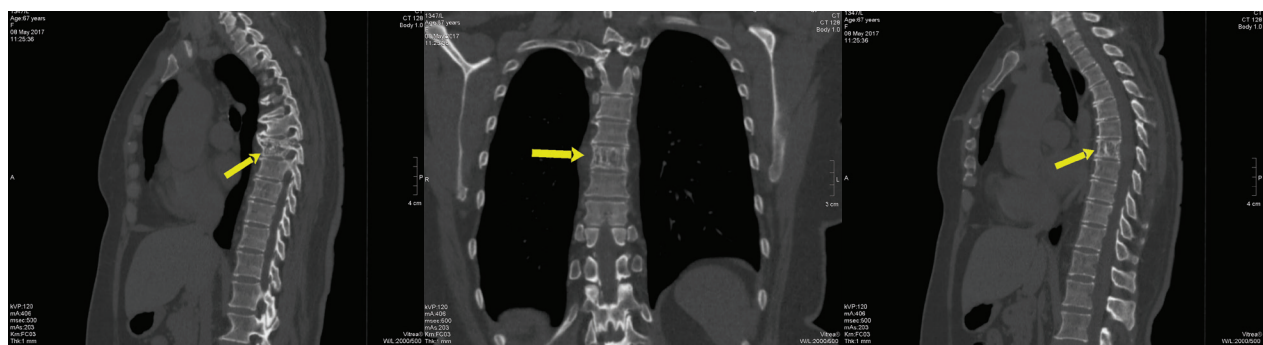


Figure 2. The MDCT examination of the thoracic spine shows rough vertical bone trabecules in the Th7 vertebral bodies.

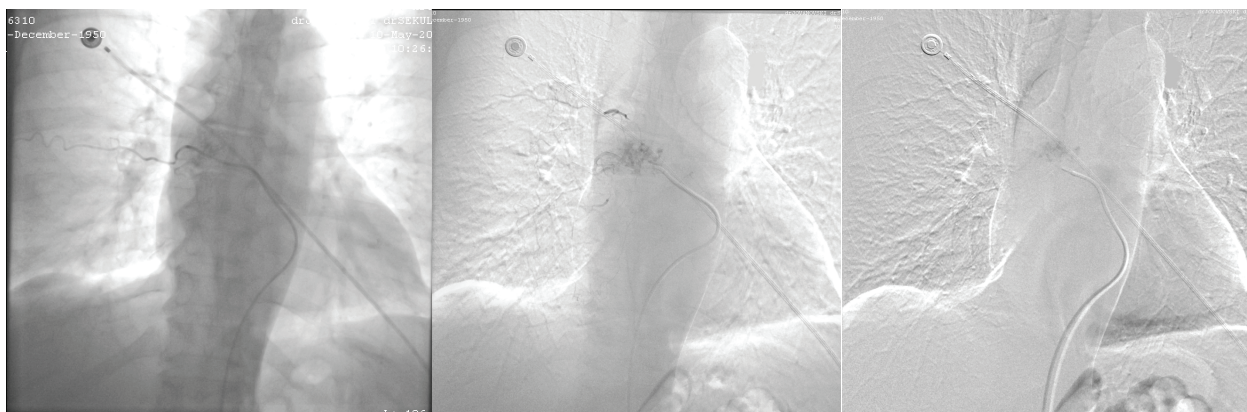


Figure 3. Left - Selective angiography of the VII intercostal artery (a pathological network in the body TH7- hemangioma); Middle - Supraselective angiography with more distinctive presentation of the pathological vascular network in the Th7 vertebral bodies; Right - Supraselective angiography after embolisation- significantly reduced pathological network of hemangioma is detected

The MDCT imaging with and without intravenously applied contrast describes changes in Th7 vertebrae as a highly suspected of hemangioma that occupies vertebrae body and both of the pedicles.

Transcatheteric spinal angiography and embolisation are preoperatively carried out. Catheter was selectively placed via right transfemoral approach in the intercostal artery on the level inferior part of Th7 vertebral body that goes under inferior part of the seventh rib on the right side. The contrast was applied and angiography was performed showing pathological vascularisation inside the right aspect of Th7 vertebral body. Then, embolisation particles of Embosphere 250 μ m and 500 μ m were selectively and supraselectively applied in tumour feeding artery. Control angiography showed a reduction of tumour vascularisation, no sign of blush and retention of contrast in tumour and feeding artery, as a sign of successful embolisation (Figure 3).

Six days after embolisation in our hospital, the surgery was performed for decompression and stabilisation of the spinal cord. Left thoracotomy and corpectomy of Th7 vertebrae was performed as the stabilisation of thoracic spine with the expanding titanium graft (Figure 4). Patient received 930 ml of blood transfusion during the surgical intervention.

Pathohistological analyses after resection of the Th7 vertebrae confirmed that it is cavernous hemangioma.

DISCUSSION

Vertebral hemangiomas are benign lesions made out of venous structures and capillaries (15). About 1% of vertebral hemangioma give certain clinical symptoms and signs, while the most are asymptomatic (16-18). In 55% patients the symptom is pain, while in 45% there is a neurological deficit due to the compression on neurological structures - spinal cord, spinal nerves, or because of the vertebral collapse. In pain conditions without neurological compression, preoperative procedures such as embolisation, vertebroplasty, radiotherapy or ethanol injection are performed, while in cases of progressive neurological deficit caused by spreading vertebral hemangioma that makes spinal cord compression, surgical decompression must be performed (2, 16, 19-21). However, since these hemangiomas are highly vascular tumours, significant blood loss can occur in resection. Because of that, in order to reduce complications such as preoperative hemorrhage, many surgeons are for preoperative transcatheteric embolisation of hemangioma, followed by resection and stabilisation of the spine. Because of the high rates of recidivism after partial resection and reconstruction or enlargement of cement mass (2.9-30%), some centers are for total aggressive spondilectomy with wide margins for the recidivism reduction (20).

The therapy procedure has not been determined so far, as well as the ideal surgical operation for the patients with symptomatic vertebral hemangiomas (9, 22, 23).

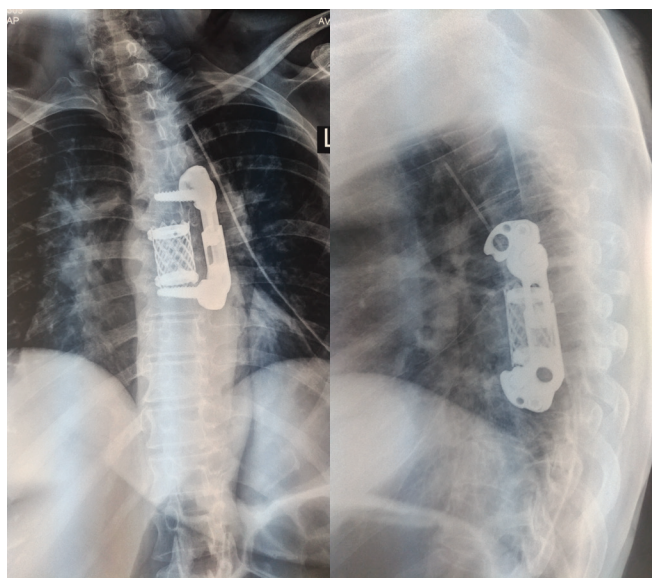


Figure 4. Medical condition after corpectomy Th7 and stabilisation of the thoracic spine by expanding titanium graft and lateral instrumentation



Therefore, the surgical treatment is required in cases with progressive neurological deficit, for the decompression of the spinal cord (22). Embolisation prior to symphyctomic vertebral hemangioma surgery is recommended by most of the authors as relatively safe procedure with rare complications (11, 18, 24). Postoperative radiotherapy should be performed in the patients with subtotal tumour resection to prevent recurrence (25). However, some authors recommended surgical procedure, embolisation and radiotherapy as the gold standard for the treatment of symptomatic vertebral hemangiomas (15, 26, 27).

Conventional radiography of vertebral hemangiomas can show parallel linear lines or honeycomb appearance of the vertebrae. The MDCT is also used as an alternative for the MRI for the diagnoses and assessment of the grade and aggressivity of the tumour and its contact with anatomical structures around with typical "Polka-dot-sign" due to trabecular aspect of the involved vertebra (15, 18, 26, 28, 29).

Hemangiomas in more than one vertebrae are rare (30, 31). Five hemangiomas in cervical and thoracic vertebrae were detected in our patient, one of which was symptomatic and embolised, being operated and stabilised afterwards.

Blood loss of about 930 ml during the surgery in our patient was compensated with blood transfusion, and this blood loss is common in treatment of aggressive vertebral hemangioma, with preoperatively performed embolisation, which is similar to Robins et al. where the compensation of blood after the tumour embolisation was 981 ml (range of 143-1048 ml), while in patients without embolisation was on an average level was 1629 ml (32). Significant hemorrhage from feeding artery during the surgery and later in epidural space has caused more surgeons to perform preoperative embolisation (15).

In cases with neurological compressive symptoms, the method of choice for the vertebral hemangiomas therapy is surgery for decompression of nerve structures. Aggressive vertebral hemangioma embolisation is recommended and preoperatively performed for the hemorrhage risk reduction (32), but significant factor in intraoperative hemorrhage grading is invasivity of surgical treatment (33, 34). Embolisation is relatively low-risk procedure, and the adverse effects are rare (embolus with cardiovascular problems, stroke, periphery arterial occlusion and ischemia of the spinal cord, allergic reactions and hemorrhage) (9, 15, 35). Permat et al. showed that combined percutaneous embolisation and vertebroplasty are safe and effective procedures, analysing 26 patients through 19 years with follow-up period of 22-217 months (9).

CONCLUSION

Preoperative embolisation of vertebral hemangiomas significantly reduces intraoperative hemorrhage, typical for operatively treated tumours, which reduces possible complications of surgical treatment.

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